

*Guaranteed
Heating
Satisfaction
at minimum cost*

**for the Architect
Heating Contractor
and the Owner**



Guaranteed Heating Satisfaction at minimum cost

THE truth about boiler ratings. A money saving discussion of the heating problem for the Architect, Heating Contractor and Owner.

THE H. B. SMITH COMPANY

Established 1854

Westfield, Massachusetts

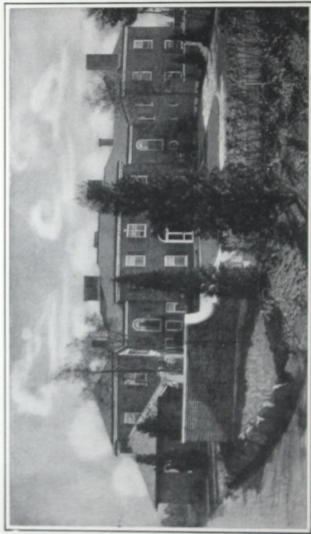
Manufacturers of Smith Boilers for steam, hot water and vapor heating; radiators; and hot water supply boilers; for every type and size of private home, office building, factory and public building.

Sales Offices and Warehouses at

WESTFIELD, BOSTON, NEW YORK, PHILADELPHIA, CLEVELAND

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The H. B. Smith Company, Westfield, Massachusetts



"Savin Hill, estate of Bayard Tuckerman in Hamilton, Massachusetts, where the Prince of Wales paid a brief visit in October, 1924. Heating is furnished by two number forty-four Mills Water Tube Boilers made by the H. B. Smith Company, Bigelow and Wadsworth, Architects; H. E. Whitten Company, Heating Contractors."

The Truth about **BOILER RATINGS**

A pertinent, money-saving discussion of interest to owners of homes and buildings, and to those who are about to build them.

THIS book is not intended to be a complete discussion of the heating problem. Its purpose is to discuss one phase of the heating problem only, namely: boiler ratings. Long experience in the heating industry has shown us that this phase of heating stands in great need of a simple, commonsense explanation.

If you have had to buy a heating boiler lately, or if there is a chance that you will have to buy one in the near future, you have discovered, or it will be to your advantage to discover beforehand, that the subject of boiler ratings is a stumbling block to the unwary.

Briefly, and non-technically, the rating of a boiler means the size of the heating job that it can do. The rating answers the question, "How large a home or building can this boiler heat?" Or, to ask the question in the other direction, "How large a boiler do I need to heat my home?"

This seems like a very simple matter. But it isn't.

A great deal of trouble and misunderstanding arises from the fact that there is no standard method of rating a boiler. Imagine the trouble that would be caused if there were no standard way of measuring a ton of coal—some dealers giving you 2000 pounds and some giving you only 1000 pounds to the ton. Imagine that, and you begin to realize the situation that exists on boiler ratings.

Take any one particular boiler and ask several boiler manufacturers to give it a rating. You will receive as many different answers as there are manufacturers. In other words, each manufacturer will recommend the same boiler for a different size house. How can this be?

The strange part of the situation is, judged solely on the basis of whether the boiler will furnish enough heat to keep the house warm, that one manufacturer is as right as another. Though each is different, each is right. What is the solution of this paradox?

It is true that by decreasing the length of the firing period (which is technical talk for saying that you will have to tend the fire oftener), and by working the boiler beyond its capacity; and by burning more pounds of coal per square foot of grate surface per hour—all the heat you need for the home can be developed.

But, oh, prospective owner, beware of the large coal bills that will be yours under such conditions. Warm, your home will be, and warm indeed your chimney—yet if you could see the tons of coal that you would have to shovel, the pyramids of ashes that would have to be carted away, and the sheaf of coal bills that would confront you; if every cubic inch of wasted hot gases escaping up your chimney had a visible dollar sign attached to it, then you would indeed groan in despair and condemn your heating contractor to Hecklebirnie, which has been located three miles the other side of the hot place. And

all because the rating of the boiler did not mean what, on the face of it, it seemed to mean.

It is the old story of low first cost on one hand, and of high operating cost on the other. And it is only human nature that has brought such a condition to pass.

The Development of Boiler Ratings

IN THE early days of the boiler industry, scientific testing was of the unborn future. The manufacturer designed a model, estimated its capacity, installed a number of boilers, checked his estimates from these cellar demonstrations and rated his boiler for so many feet of net radiation.

In justice to all, it is only fair to say that rating a boiler is at best a difficult matter, because of factors that are hard to eliminate or hold constant. No two boiler installations are surrounded by identical conditions. The chimney may make all the difference in the world in the way a boiler performs.

Importance of the Chimney

IF THE boiler is the heart of the heating system, the chimney is the lungs. If the "lungs" are bad, even a good "heart" is of no avail. Chimneys must be high enough and wide enough. Too many openings into a chimney, as from fireplaces on floors above, greatly impair its efficiency. If higher buildings are close to yours; if wind currents are directed in certain ways against the chimney by the conformation of the roof, nearby trees or other buildings, and not properly compensated for in the design of the chimney, the boiler cannot deliver heat as efficiently as it might under more favorable conditions.



Quality of Coal Used

THE quality of the coal used is another factor that limits the efficiency of a boiler and upsets its rated capacity. Coal varies tremendously in the number of heat units it contains. Some manufacturers give their boilers a high rating on the assumption that the best grade of coal will be used. The ratings of Smith Boilers are such that better results can be expected from average quality coal.

Coal in general is constantly becoming poorer. It is extremely important that a boiler have plenty of reserve capacity.

Keeping the Boiler Clean

ANOTHER factor hard to allow for in rating a boiler is the care it will receive in regard to cleaning. The products of combustion deposited within a boiler are almost perfect heat insulators. The more soot that is allowed to collect, the more difficult it is for the boiler to transmit heat to the water in the tubes, just as a badly carbonized automobile engine lacks power.

It is positively essential that the boiler be kept clean. In Smith Boilers, not only is the design such that soot deposits are reduced to a minimum, but they are also arranged for easy cleaning.

Imagine the difficulty an owner finds himself in on a cold winter morning if the boiler has been rated on the assumption that only the best quality coal will be used, that the chimney is perfect, and that the boiler is kept free of soot deposits at all times. Such conditions are far too ideal to be expected in this average world.

In addition to considering ideal rather than average operating con-



ditions, some boiler manufacturers also add to their rated capacity the heat which escapes into the cellar. Smith Boilers are rated only on the heat delivered to the system; in other words, at the nozzle.

End of Early Conservatism

MANUFACTURERS in the early days generally were conservative, inclined to rate their product too low rather than too high. Because these ratings were conservative they became the basis of boiler purchases. When it was seen that boilers were sold on ratings, of course some bright party raised his. While watching developments, the rest of the manufacturers went to the starting line and, figuratively speaking, warmed up their motors. The crowd fell for the raised ratings. Immediately the manufacturers gave their ratings the gas. The race was on and speed limits haven't counted since, although, of course, merely rating a boiler higher does not increase, and never can increase, its capacity for doing an economical job.

Most manufacturers have sincerely tried to furnish ratings that would give general satisfaction. But to keep increasing their ratings on identically the same boilers, in order to allow their contractors to underbid the contractors who sell other boilers, results only in confusion, in offering a purchaser a chance to save in first cost without clearly explaining the higher cost of operation which this entails.

Some day all this will be changed. The Bureau of Standards in Washington will take up the matter of ratings, and a standard method for figuring ratings will be determined. And then the man who buys the boiler will have nothing to fear. He will get enough heat to keep the house warm and be sure of burning a minimum amount of coal. But until that time comes it is well to

have a clear understanding of one's own of what determines the capacity of a boiler.

Basis of Economy

COAL at present and future prices is a more important factor in heating costs than it used to be. A reasonable increase in the economy and efficiency of a boiler and the yearly saving in fuel expense makes the first cost of the boiler a secondary matter.

It is time boilers were rated for efficiency and economy. What are the important facts in determining the efficiency and economy of a boiler? Grate capacity is one but it is far from being the most important. For while coal is burned on the grate, and a large grate naturally gives opportunity to burn a large amount of coal, "What becomes of the heat given off in combustion?"—is far more important. Otherwise, you might as well burn your coal in the bin, except for the fire risk.

Apples on the tree will not produce profit if they are going to rot there. You have got to get them to market. How are you going to market your heat? By means of fire surface! And did you ever notice how shy the average catalogue is in giving the amount of fire surface in boilers and explaining what type it is, whether direct or indirect? We have published ours for years. Fire surface is where the real business of the boiler is done; where the heat is absorbed and made available for distribution through the system.



If you want to prove the worth of fire surface, take the flue temperature of the escaping gases. If the fire surface has absorbed the heat, you won't find waste heat in the chimney, but if there isn't enough fire surface, or if

it is improperly designed, you will find a high chimney temperature and the heat from the coal is on the way to try to heat all outdoors. Before buying a boiler look up the fire surface. Insist on having these figures, and before accepting a rating find out what the temperature of the escaping flue gases is at that rating.

How Smith Boilers are Rated

FARTHER on in this book we reproduce several tables of rating figures as prepared for our three styles of boilers—the Mills Water Tube Boiler, the Smith Smokeless Boiler, and the H-B Round Boiler. At the end of the book you will find illustrations of typical sizes of these three types of boilers, with a brief note as to the types of buildings for which each is best adapted.

To get back to the tables on ratings mentioned just above. Each table shows three different ratings for each boiler. We have called these "Danger Red," "Practical Black," and "True Blue."

The "Danger Red" rating gives the capacity of the boiler if rated in the way that is in danger of becoming common practice. If you wish to turn a deaf ear to coal bills, in order to save a few dollars on the first cost of your boiler, you can get all the heat you want. That is, we would guarantee it under the conditions stated, but we have never recommended rating a boiler that way, and we do not now recommend it.

The "Practical Black" ratings are the commercial standard catalogue ratings which we have published, do publish, and shall continue to publish.

The "True Blue" ratings permit the boiler to operate with a maximum of fuel economy and heating satisfaction.

Turn to pages 18 to 25 where you will find these tables of ratings. Take the ratings for the No. 34 Mills Steam Water-Tube Boiler. On page 19 note that 10 sections are given a rating of 4900 feet of steam radiation when rated by the "Danger Red" method. Now note that our "Practical Black" rating, rates 13 sections, with 4800 feet of steam radiation. Here is a difference in first cost of the cost of three additional sections. The approximate amount of money this represents, exclusive of the extra labor charge involved in installing the additional three sections, is \$250.

Now note the same chart again. The 10 sections No. 34 Mills "Danger Red" rated at 4900, burns 15 pounds, more or less, of coal per square foot of grate surface per hour. The 13 section, No. 34 Mills "Practical Black" rated at 4800 burns approximately $33\frac{1}{3}$ per cent less per square foot of grate surface per hour. Under those conditions both boilers would keep the same house completely warm.

Cash Saving

NOT to get too involved in a technical discussion, our engineers have figured that in a boiler-winter season of 30 weeks, the 13 section boiler would save 7 to 10 tons of coal, depending upon geographical location, type of building construction, and care given to the boiler, or, in money, about \$160.

The above figures show approximate savings when the boilers are operated at the capacity shown. Now the fact is that the usual operation of the boiler will be less than full capacity rating, due for instance to warm spells of weather and the banking of the fire at night. But even in such average operation, the owner can be sure of a saving in operating cost per year of 15 per cent on his

investment, if the larger boiler is used, as it would be if rated on the basis of our "Practical Black" ratings.

Compare this cash saving mentioned with the saving in first cost if you used the 10 section boiler. Then consider that the boiler is bought only once, whereas you buy coal for the same boiler twenty, thirty or forty years. Multiply the saving of one season by forty and the total saving is \$6400!

We have a number of boilers giving excellent service today that were installed over forty years ago, which is longer than most boiler manufacturers have been in business. We are the pioneers in the industry. Our products have stood for quality since 1860.

The excessively high temperatures of escaping flue gases, under "Danger Red" ratings, indicate absolute waste of coal and prove that boilers operating at a rate of combustion to justify such "Danger Red" ratings cannot absorb into the system, an economical percentage of the available heat.

Another example found on page 21, with reference to the No. 27 Smith Boiler, shows that the temperature of the gases escaping up the chimney under the "Danger Red" rating is 1000 degrees Fahrenheit (more or less), while the temperature of the escaping gases under the "True Blue" rating is 525 degrees Fahrenheit (more or less). Our "Practical Black" ratings fall in between these two.

With the No. 27 Smith Boiler the "True Blue" ratings involve a flue temperature of 525 degrees. Highly rated competing boilers under conditions to obtain their ratings would show flue temperatures 800 to 1200 degrees, because of their less efficient design.

For most other makes of boilers, 600 to 1000 degrees is often considered a normal flue temperature, which in-

dicates a tremendous waste of heat, neither absorbed by the boiler nor in any way turned to good account in heating your home.

It is a fact also, as touched upon earlier, that the high consumption of coal per square foot of grate surface per hour required before such high rating figures and flue temperatures could possibly be reached, demand in turn an ideal chimney of a diameter and height found in exceedingly few heating installations. Any boiler selected on inflated "Danger Red" ratings cannot do the heating job assigned to it under usual conditions, and on cold days the house would remain cold in spite of immense coal consumption.

It goes back to the old question they used to like to puzzle us with in school—"Which contains more heat; a kettle of boiling water or the Atlantic Ocean?" And the correct answer is the Atlantic Ocean—just as the greater number of square inches of fire surface in the 13 section boiler, although at a lower temperature, transmits the heat from the burning coal through the heating systems to the rooms of the home or building more efficiently than the fewer and hotter square inches of fire surface in the 10 section boiler.



Does it Pay to Increase Ratings Arbitrarily?

AN ILLUSTRATION of an arbitrary increase in rating is shown in the following figures which compare our "Practical Black" ratings with another manufacturer's ratings, old and new, of a boiler of the same number of sections and of practically identical outside measurements. The other manufacturer's old ratings were

AT MINIMUM COST

enough larger than ours to make a nice first cost saving to the unwary. But note how his new ratings give him a still greater advantage in telling the merits of first cost:

Sections	Our Ratings	Other Manufacturers Old Ratings	Other Manufacturers New Ratings
8	6000	8000	9600
9	7200	9000	10800
10	8400	10000	12000
11	9600	11000	13200
12	10800	12000	14400

WE HAVE an interesting story, and a true one, of an experience with another manufacturer's boiler. In a certain house the boiler, which had been installed for some years, had never been made to heat the house comfortably even in weather ordinarily cold. The contractor admitted that a mistake had been made in the size of the boiler used and they advised replacing the first boiler with another of greater capacity.

The latest catalogue of the manufacturer was secured and a boiler of higher rating was ordered. The old boiler was taken down and taken out. Then the new boiler was put in. Imagine the consternation of the owner when he discovered that the new boiler of greater capacity was of identically the same size as the first one that would not heat the house. What had happened? Only this: the manufacturer had in the meantime arbitrarily raised his ratings so that in his catalogue the same boiler was now rated at a greater capacity. The manufacturer had been caught in his own trap. We leave it to you to imagine what the owner said about it, and to decide whether that way of rating a boiler is practical.

While we are on the subject, another experience story is not out of place. In Springfield, Mass., there is a man

who owns four apartment houses, which, while not exactly alike, are practically identical. In two of them he has H. B. Smith Boilers and in the other two he has boilers of another make. Within the last year he converted all four to oil burners. A result which represents a problem to him is the fact that the two boilers of another make burn fifty per cent more oil than the two H. B. Smith Boilers.

In view of this saving in operation of the Smith Boilers, the economy of scrapping the other boilers is evident, even though they are of recent installation. Economy of operation is the true index of boiler cost.

Our Ratings Close to Ideal

THERE is one more point to be brought out as shown in the tables of ratings. The "Practical Black" ratings seem to be about half way between the "Danger Red" ratings and the "True Blue" ratings. You may ask why we do not keep our "Practical Black" ratings closer to the "True Blue" ratings, since "True Blue" ratings are ideal for operating economy.

The discrepancy is only an apparent one. As you increase the load in the boiler, that is, as you increase



the rating above the "True Blue" rating, the rate at which you lose fuel economy does not increase in the same proportion. It is very low at first but when you get farther away from the "True Blue" ratings it increases very rapidly. That is, when a 25 per cent increase in ratings is made, in a Mills No. 34 for instance, your loss in fuel economy is only 3 per cent. When a 50 per cent increase in rating is made, your loss in fuel economy is 8 per cent. But when a 100 per cent (approximate) increase in rating is made, you get a 25 per cent loss in fuel economy. In other words, our "Practical Black" ratings mean only a negligible loss, whereas the "Danger Red" ratings mean a 25 per cent loss. These losses vary with different sizes and types of boilers. Some boilers under "Danger Red" ratings show a loss as high as 60 per cent or more.

A Question Often Asked

"IF A person doesn't investigate this subject of ratings carefully," said a customer recently to one of our engineers, "and if, unknowingly, he is unfortunate enough to install a boiler that has "Danger Red" ratings, what is to prevent him from going on for years in ignorance of the fact that he is burning altogether too much coal?"

"Of course, I can see that friends who have been luckier than he may tell him that they burn considerably less coal. But even so, isn't he apt to think that the difference in coal burned lies in the type of house or in its location?"

This is a question which we are often asked. And the answer is that a boiler which has been "Danger Red" rated will reveal the fact to the owner as soon as a few days of exceptionally cold weather arrive. During ordinarily cold weather such a boiler will heat the house comfortably. But in exceptionally cold weather it has

no reserve capacity to give you. You are operating it under peak conditions all the time. Whereas the "Practical Black" or the "True Blue" boiler does have a reserve that is able to keep you warm even in periods of exceptionally cold weather.

Such extreme low temperatures do not often come, it is true. But do not lose sight of the main point, which is, not the matter of furnishing comfortable heat under extreme conditions, but the matter of economy all winter long in coal.

When Jack Frost invites us into his below-zero presence, he quickly puts a finger on the house with the "Danger Red" rated boiler. "You're cold in this house today," he says with a chuckle, "but that isn't the worst of it. The worst of it is that you are burning up more coal than you should every day all winter long."

Replacement Pays Well

FOR the especial interest of home or building owners who have to replace an old or inefficient boiler, we quote the following letter, which is typical of what often happens:

"As you know, I have two pieces of property in Roxbury at 2033 and 2045 Columbus Avenue, which are identical as to size in the number of apartments and with exactly the same amount of radiation. In each case there are new flues 12 x 16 inches in diameter.

"In one Building I put in four years ago a Boiler other than you make to heat these apartments. As the Boiler was of proper capacity of course it did the work. Year before last I heated

the other Building with one of your nine section No. 36 Smith Boilers, which was of the same capacity as the other Boiler. After a while my janitor reported that the Smith Boiler was burning much less coal than the other Boiler. I made a test on this and found his statements to be correct. I immediately gave orders to have the other Boiler taken out and to have another one of your nine section No. 36 Smith Boilers installed. This was done and immediately cut down my coal consumption.

"In connection want to say that my old Boiler burnt ninety tons of hard coal at \$15.00 per ton, and the Smith Boiler burnt sixty tons of soft coal at \$8.50 per ton. A saving of \$910.00 per season on each Boiler."

"From the foregoing statement I have come to the conclusion that the initial cost of the heating Boiler is only a secondary consideration, as I have found the largest overhead expense on Apartment House property is the coal bill.

"This spring I have also replaced three other Boilers that were in good condition with Boilers of your make. My only reason for changing was of the fact of the saving in fuel."

(Anthracite Coal, Oil, Gas and Coke)

3% Loss in fuel economy when 25% load is added to "True Blue" Ratings.
8% "
30% "

No. 34 MILLS WATER TUBE BOILERS

(Anthracite Coal, Oil, Gas and Coke)

[illegible]

34. Loss in fuel economy when 25% load is added to "True Blue" Ratings.

[illegible]

" " " " " " " " load equals "Danger Red" Ratings.

No. 44 MILLS WATER TUBE BOILERS

(Anthracite Coal, Oil, Gas and Coke)

GUARANTEED HEATING SATISFACTION

No. 44 MILLS	"DANGER RED" Feet of Radiation	"PRACTICAL BLACK" Feet of Radiation	"TRUE BLUE" Feet of Radiation
<div>7 Sections</div> <div>8 " "</div> <div>9 " "</div> <div>10 " "</div> <div>11 " "</div> <div>12 " "</div> <div>13 " "</div> <div>14 " "</div> <div>15 " "</div> <div>16 " "</div> <div>STEAM</div>	Temperature of escaping flue gases 700° FAH. + or — 4320 5140 5960 6780 7600 8420 9240 10060 10880 11700 17 lbs. + or — coal per sq. ft. of grate per hour.	3600 4200 4800 5400 6000 6600 7200 7800 8400 9000	Average temperature of escaping flue gases 425° FAH. 2400 2800 3200 3600 4000 4400 4800 5200 5600 6000 6 to 7 lbs. coal per sq. ft. of grate per hour.
<div>7 Sections</div> <div>8 " "</div> <div>9 " "</div> <div>10 " "</div> <div>11 " "</div> <div>12 " "</div> <div>13 " "</div> <div>14 " "</div> <div>15 " "</div> <div>16 " "</div> <div>WATER</div>	Temperature of escaping flue gases 700° FAH. plus or minus. 7125 8475 9825 11175 12550 13900 15250 16600 17950 19300 17 lbs. plus or minus coal per sq. ft. of grate per hour.	5950 6925 7925 8900 9900 10900 11875 12875 13850 14850	Average temperature of escaping flue gases 425° FAH. 3950 4625 5275 5950 6600 7250 7925 8575 9250 9900 6 to 7 lbs. coal per sq. ft. of grate per hour.

4% Loss in fuel economy when 25% load is added to "True Blue" Ratings.
 10% " " " " " " 50% " " " " " "
 30% " " " " " " load equals "Danger Red" Ratings.

No. 27 SMITH SMOKELESS BOILERS

(All Bituminous Coals, Anthracite Coal, Oil, Gas and Coke)

No. 27 SMITH	"DANGER RED" Feet of Radiation	"PRACTICAL BLACK" Feet of Radiation	"TRUE BLUE" Feet of Radiation
5 Sections	1700	1200	800
6 "	2150	1500	1000
7 "	2600	1800	1200
8 "	3050	2100	1400
9 "	3500	2400	1600
10 "	3950	2700	1800
11 "	4400	3000	2000
12 "	4850	3300	2200
13 "	5300	3600	2400
14 "	5750	3900	2600
15 "	6250	4200	2800
16 "	6700	4500	3000
STEAM	Temperature of escap- ing flue gases 1000° FAH. plus or minus.	15 to 20 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.	Average temperature of escaping flue gases 525° FAH. 4 to 7 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.
5 Sections	2800	1975	1325
6 "	3500	2475	1650
7 "	4300	2975	1975
8 "	5025	3475	2300
9 "	5775	3950	2650
10 "	6525	4450	2975
11 "	7250	4950	3300
12 "	8000	5450	3625
13 "	8750	5950	3950
14 "	9500	6425	4300
15 "	10325	6925	4625
16 "	11050	7425	4950
WATER	Temperature of escap- ing flue gases 1000° FAH. + or —	15 to 20 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.	4 to 7 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.

ed. Loss in fuel economy when 25% load is added to "True Blue" Ratings.

3% Loss in fuel economy when 25% load is added to "True Blue" Rating

12%	"	"	"	"
12%	"	"	"	"
15%	"	"	"	"
50%	"	"	"	"
load equals "Danger Red" Ratings.	"	"	"	"

(All Bituminous Coals, Anthracite Coal, Oil, Gas and Coke)

No. 36 SMITH	"DANGER RED" Feet of Radiation	"PRACTICAL BLACK" Feet of Radiation	"TRUE BLUE" Feet of Radiation
7 Sections	3930	3300	1800
8 "	4550	2800	2100
9 "	5200	3300	2400
10 "	5850	3800	2700
11 "	6500	4300	3000
12 "	7150	4800	3300
13 "	7800	5300	3600
14 "	8450	5800	3900
15 "	9100	6300	4200
16 "	9750	6800	4500
17 "	10400	7300	4800
18 "	11050	7800	5100
	Temperature of escaping flue gases, 1100° FAH., + or —		Average temperature of escaping flue gases 575° FAH.
	18 to 24 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.		5 to 8 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.
7 Sections	6425	3800	2975
8 "	7500	4625	3475
9 "	8575	5450	3950
10 "	9650	6275	4450
11 "	10725	7100	4950
12 "	11800	7925	5450
13 "	12875	8750	5950
14 "	13950	9575	6425
15 "	15025	10400	6925
16 "	16100	11225	7425
17 "	17150	12050	7925
18 "	18225	12875	8425
	Temperature of escaping flue gases 1100° FAH. plus or minus.		Average temperature of escaping flue gases 575° FAH.
	18 to 24 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.		5 to 8 lbs. coal per sq. ft. of grate per hour, according to size of grate selected.

6% Loss in fuel economy when 25% load is added to "True Blue" Ratings.

15% " " " " " " " " " " " "

40% " " " " " " " " " " " "

50% Load equals "Danger Red" Ratings.

(All Bituminous Coals, Anthracite Coal, Oil, Gas and Coke)

"True Blue" Ratings.
Loss in fuel economy when 25% load is added to "True Blue"
"Danger Red" Ratings.
Load equals "Danger Red" ratings.

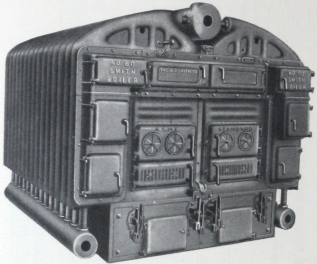
H-B ROUND BOILERS

(Anthracite and Bituminous Coals, Oil, Gas and Coke)

H-B ROUND	"DANGER RED" Feet of Radiation	"PRACTICAL BLACK" Feet of Radiation	"TRUE BLUE" Feet of Radiation
227	Temperature of escaping flue gases 1100° FAH. plus or minus.	14 lbs. + or - coal per sq. ft. of grate per hour.	Average temperature of escaping flue gases 400° FAH.
224	1600	1075	825
223	1350	825	575
221	875	700	375
219	650	550	300
217	400	425	200
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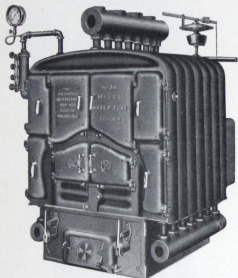
8% Loss in fuel economy when 25% load is added to "True Blue" Ratings.

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No. 60 Smith Smokeless Boiler

FOR steam or hot water heating of large residences and public buildings. It will burn any kind of fuel; all grades of bituminous coals and lignites with a minimum amount of smoke, conforming to all smoke ordinances; minimum amount of attention; maximum amount of efficiency, and will burn all other fuels—anthracite coal (all sizes), coke (all sizes), oil, wood, with a maximum amount of efficiency.



No. 34 Mills Water Tube Boiler

FOR steam or hot water heating. The economy of the Mills Water Boiler is due to its vertical water tubes which the hot flames envelope and the fact that the Mills Boiler has a larger per cent of direct fire surface than any other boiler. Made in sizes Nos. 24, 34, 44 and 48.



No. 224 H. B. Round Boiler

FOR steam or hot water heating of average size homes. Will burn anthracite and bituminous coals, oil, gas or coke. Made in size Nos. 15, 17, 19, 21, 23, 24 and 27.

AT MINIMUM COST



***Smith No. 17 Hy-Test Boiler
for Hot Water Supply***

TESTED to 300 lbs. hydrostatic pressure per square inch, this boiler properly installed insures absolute safety, no matter what the local conditions, and will supply hot water at a fraction of the cost of gas heaters. The American Society of Mechanical Engineers Standards. Made in sizes Nos. 110, 113, 17 and 24, for small homes up to the largest of buildings.



Princess Direct Radiator

PRINCESS radiators are radically different in design from ordinary radiators. Note the wide spacing between the sections. The purpose of the wide spacing is to increase efficiency. If the radiator were covered with a blanket, the transmission of heat to the air in the room would cease. The same thing tends to happen when the sections of a radiator are closely nested. The wide spacing between sections in the Princess radiator permits the free circulation of air over its heated surfaces, resulting in the rapid transmission of heat, and making the Princess the most efficient of radiators.

Furthermore, wide spacing is important because it permits the radiator to be easily cleaned, preventing unsightly and unhealthy accumulations of dust and dirt.

*A few famous places
where Smith Products
are installed*

White House



Chevy Chase



Lincoln Memorial

THE foregoing pages have been prepared with the sincere desire to point out to owners, and those about to own, the unwisdom of always accepting the rating of a boiler as the only criterion for its suitability for heating your property.

A representative from one of our branch sales and warehouses, or any architect familiar with our product, or any heating contractor who handles our products, will gladly help you apply and adapt this information to fit your own needs.



